

# PATEN SPECIFICATION

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## DRAWINGS ATTACHED

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- (72) Inventor PHILLIP STANLEY ROOTS



## (54) BEAMS FOR USE IN FORMING SELF-SUPPORTING FRAMEWORKS AND FRAMEWORKS FORMED THEREFROM

- (71) We, ST. BERNARD PLASTICS LIMITED, A British Company, of Lynchford Lane, Farnborough, Hampshire, do hereby declare the invention for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- The present invention relates to beams for use in forming self-supporting frameworks and to frameworks formed therefrom.
- Self-supporting frameworks have been made from reinforced plastics, for example, glass fibre reinforced plastics, whereby the framework is fabricated from tubes cut to length and bonded together to form a space frame type of framework. The cutting of the tubes to the correct dimensions and the temporary fixing of the framework before bonding the tubes together is both tedious and time consuming.
- Self-supporting box frames formed in this way are used, for example, by the motor vehicle manufacturing industry for the support of tooling patterns and like tooling aids. It is an aim of the present invention to simplify the fabrication of such frames.
- According to the present invention there is provided a beam comprising two spaced tubes extending longitudinally of the beam and a separately formed intermediate web contained between the two tubes and connecting the tubes one with the other, said tubes and said web being formed from reinforced plastics.
- Such a beam can be formed in long lengths which can be cut to the required length when forming a framework therefrom.
- Preferably, the web has corrugations, extending between the two tubes, of substantially rectangular cross-section and so dimensioned as to be capable of receiving the end of a similar beam of less width arranged perpendicular to said web. A further corrugated web may be provided linking the two tubes such that the two corrugated webs touch mutually opposed corrugations, and thereby form a plurality of tubular members between each two pairs of touching opposed corrugations.
- The web may have a sandwich construction incorporating a light weight core, for example, a rigid foam or honeycomb. Preferably, the reinforced plastics is glass fibre reinforced plastics.
- According to the present invention there is also provided a self-supporting frame-work including beams as hereinbefore defined.
- An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—
- Figure 1 is a fragmentary side elevational view of a support member in the form of a beam constructed according to the present invention;
- Figure 2 is an end view of the support member of Figure 1;
- Figure 3 is a fragmentary plan view of the support member of Figure 1; and
- Figure 4 is a fragmentary perspective view showing an arrangement for connecting two support members of the kind shown in Figures 1 to 3.
- A frame (not shown), e.g. for supporting a tooling pattern as aforesaid, is itself self-supporting and is made up of glass reinforced plastics support members as shown in Figures 1 to 3.
- Each support member is formed by a beam comprising two mutually parallel tubular portions 1 and 2 which are inter-connected by a corrugated web portion 3.
- Figure 4 shows one way in which two support members of the kind shown in Figures 1 to 3 can be joined together to form part of a support frame.
- The two tubular portions 1a and 1b of two support members are connected by a corner member 4 made of glass reinforced plastics.
- A similar corner member (not shown) connects the other two tubular portions 2a and 2b (not shown) and the two corner members

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4 are interconnected by a tubular member 5.

The various support members making up the support frame are bonded to one another at their joints.

5 Figure 1 also shows in broken lines, a second support member 6 which has its end located in a corrugation web portion 3 to form a cross-member of a support frame.

10 A support frame for a pattern may be assembled from a number of support members shown in the drawings. Individual support members may be cut to length to form the sides and cross-members of the frame.

15 The corrugations in the web portions 3 serve both to strengthen the support members and also to locate other support members which are acting as cross-members.

20 One of the particular advantages of a framework fabricated from the support members shown in the figures, is that the fabricator is supplied with a plurality of beams which have already been made up, and that it is only necessary for him to cut the beams to the required length for the size of the frame-work.

25 This saves considerable time for the fabricator, and allows the important fabricating and bonding processes of the beams to be performed in suitable mass production conditions.

30 The top and bottom tubes of each beam may be of any desired cross-section, and the web linking the two tubes may be of any desired type as long as it performs the required function. For example, the web may be formed by two corrugated webs arranged so as to form

35 a plurality of liquid tubes. The webs may be strengthened by being formed as a sandwich construction employing light weight cores such as rigid foam or honeycomb.

40 WHAT WE CLAIM IS:—

1. A beam comprising two spaced tubes extending longitudinally of the beam and a separately formed intermediate web contained

between the two tubes and connecting the tubes one with the other, said tubes and said web being formed from reinforced plastics.

2. A beam as claimed in Claim 1, wherein the web has corrugations extending between the two tubes.

3. A beam as claimed in Claim 2, wherein the corrugations are substantially rectangular in cross-section and are so dimensioned as to be capable of receiving the end of a similar beam of less width arranged perpendicular to said web.

4. A beam as claimed in either Claim 2 or 3, wherein a further corrugated web is provided linking the two tubes such that the two corrugated webs touch mutually opposed corrugations, and thereby form a plurality of tubular members between each two pairs of touching opposed corrugations.

5. A beam as claimed in any one of the preceding Claims, wherein the web has a sandwich construction incorporating a light weight core.

6. A beam as claimed in any one of the preceding Claims, wherein each of the tubes has a rectangular cross-section.

7. A beam as claimed in any one of the preceding Claims, wherein the reinforced plastics is glass-fibre reinforced plastics.

8. A self-supporting framework including beams as claimed in any one of the preceding claims.

9. A beam substantially as hereinbefore described with reference to the accompanying drawings.

10. A self-supporting framework substantially as hereinbefore described with reference to the accompanying drawings.

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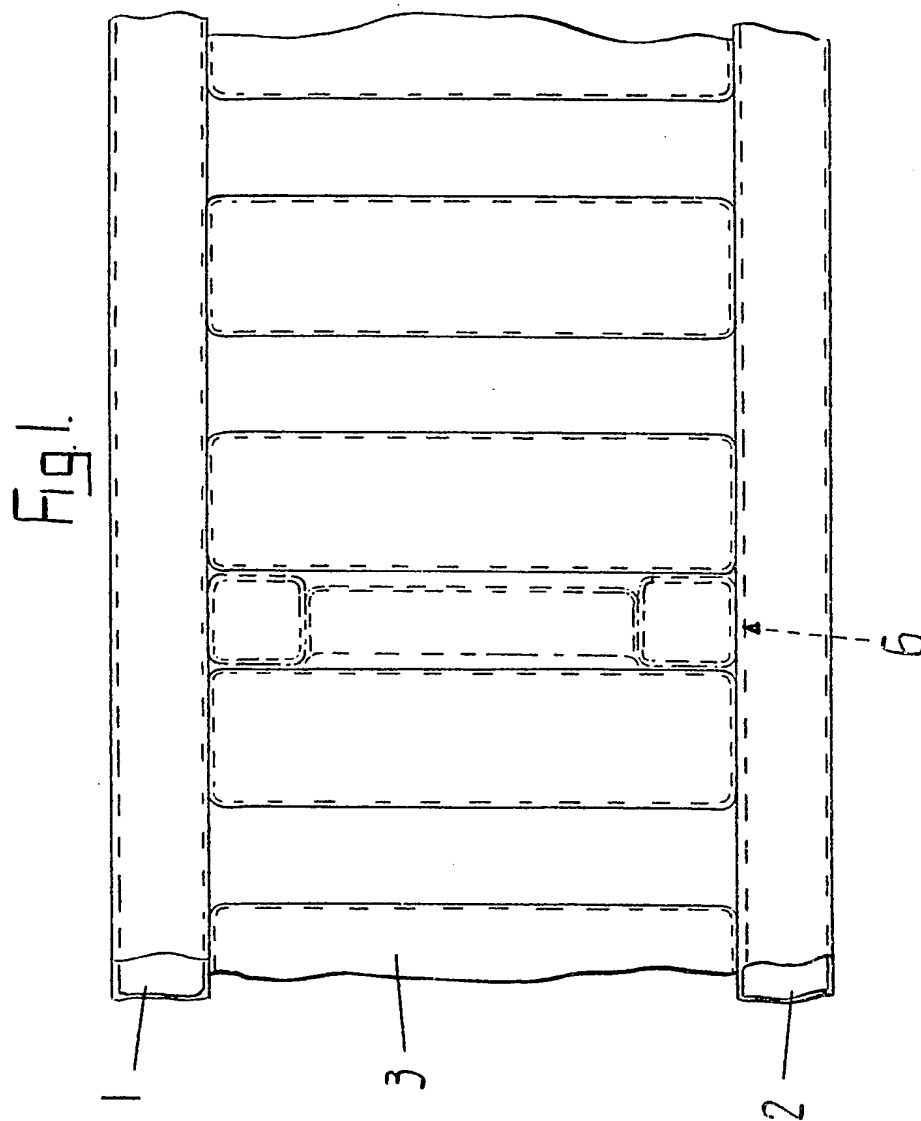
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COMPLETE SPECIFICATION

3 SHEETS

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Sheet 1



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3 SHEETS

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Sheet 2

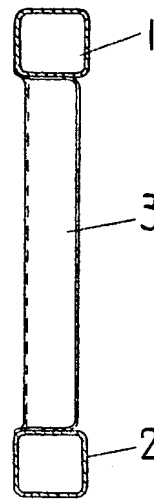


Fig. 2.

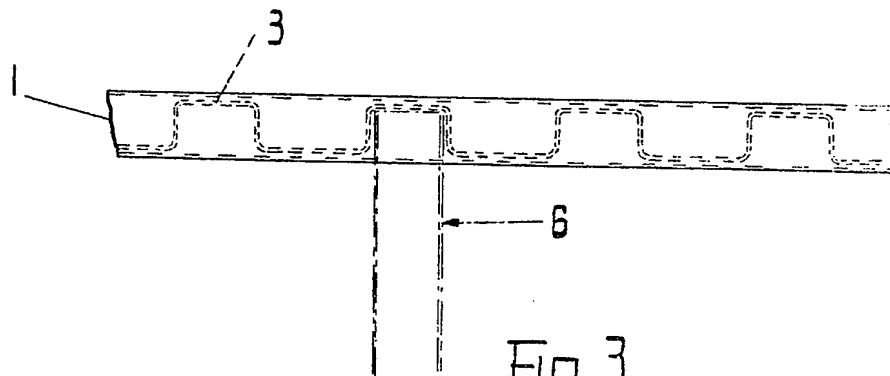


Fig. 3.

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COMPLETE SPECIFICATION

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the Original on a reduced scale  
Sheet 3

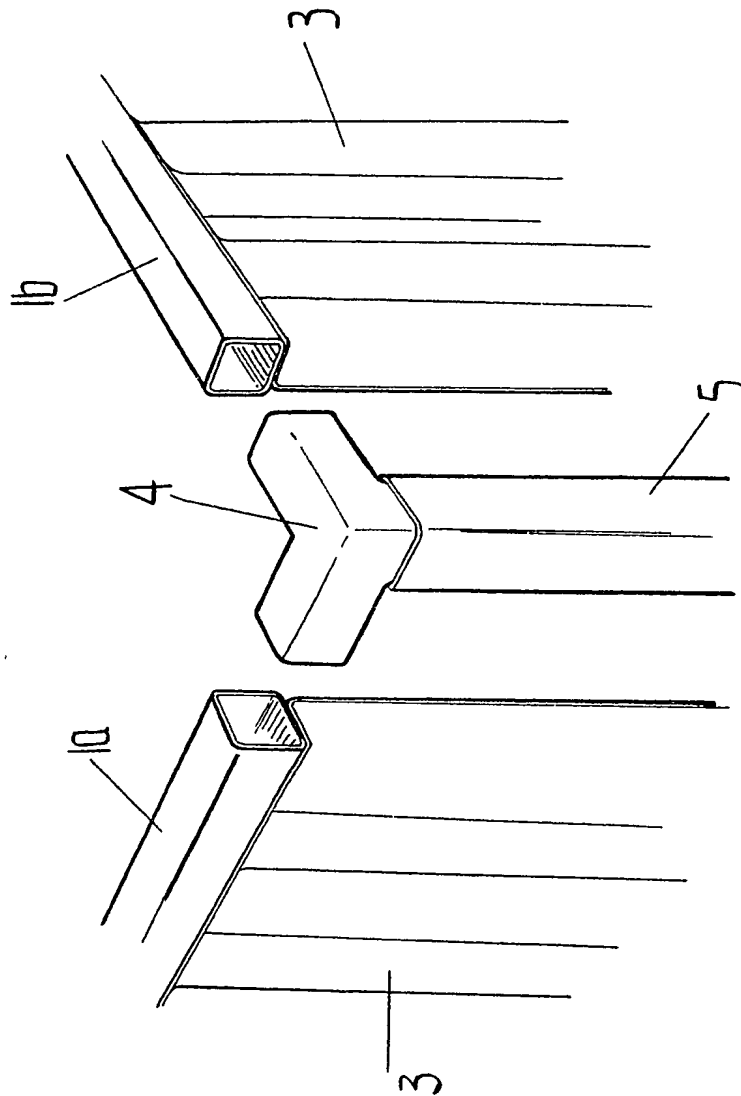


Fig. 4

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